

Weekly Assessment of CVP and SWP Delta Operations on ESA-listed Species

1. Executive Summary

a. Operations anticipated during the week

See Weekly Fish and Water Operation Outlook document for June 15 – June 21.

OMR Management has off-ramped under the PA and ITP for salmonids for natural winter-run and spring-run Chinook salmon and steelhead due to temperature.

b. Delta Smelt summary

Based on distribution patterns over the past decade and rare detections in this water year, Delta Smelt are unlikely to be prevalent in the South Delta. Limited detection data support Delta Smelt being present in Lower Sacramento and in the Sacramento Deep Water Ship Channel. The likelihood of Delta Smelt adult entrainment is low due to seasonal timing. The likelihood of larval entrainment is decreasing compared to the previous seven days due to warming temperatures and seasonal timing. The most recent detection of a Delta Smelt was on 5/6/21. The less negative OMR Index values decrease the potential for entrainment of Delta Smelt into the South Delta.

c. Monitoring Teams summary

The Salmon Monitoring Team met to discuss WY 2021 season summary and suggestions for changes to the guidance document.

There were no non-consensus issues to report from the Smelt Monitoring Team.

2. Operational and Regulatory Conditions

See current Weekly Fish and Water Operation Outlook document.

3. Biology, Distribution, and Evaluation

Delta Smelt

POPULATION STATUS

- **Delta Smelt Life Stages:**
 - Juveniles and Larvae
- **Brood Year 2020:**

Abundance estimate: The most recent population abundance estimates for Delta Smelt is 14,442 for Age-0. This estimate was calculated from the sampling between 5/3/2021-5/7/2021. The most recent detections of a Delta Smelt were two on 5/6/21, a 24.8 mm FL (EDSM) caught in the Lower Sacramento Stratum and 25.0 mm FL (20-mm Survey) caught in the Sacramento Deep Water Ship Channel. FCCL Broodstock collections are complete for WY2021.

Biological Conditions: The Smelt Monitoring Team discussed the most recent monitoring data (Table 4) and considered professional opinion on the historical trends in regional distribution. Recent detections have been in the Sacramento Deep Water Ship Channel or the Lower Sacramento stratum. Larval Delta Smelt have been detected confirming spawning has occurred.

DISTRIBUTION

• **Current Distribution**

- Real time detection data is currently limited to EDSM sampling, Summer Towner and 20 mm Survey. Since April there were only nine detections, and the Smelt Monitoring Team’s capacity to estimate where Delta Smelt are within the Delta is limited. Most detections have occurred in the Sacramento Deep Water Ship Channel and the Lower Sacramento.
- The last Delta Smelt detections were on 5/6/2021 in the Lower Sacramento and Sacramento Deep Water Ship Channel stratum.
- Larval sampling began at the Skinner Fish Facility (SFF) on 2/22/2021 and the Tracy Fish Collection Facility (TFCF) on 2/15/2021. No larval Delta Smelt have been detected at either facility. The conclusion of larval sampling was requested by the SMT on 6/1/2021 at both facilities for WY2021.
- TABLE 8. Summary of recently reported detections of Delta Smelt by Region and Salvage Facilities between 6/1/2021 and 6/8/2021. Start and End dates reflect period of time between updates to SMT. Regional categories are determined from EDSM sampling. Delta Smelt >58mm FL are considered adults.

Life Stage	North	South	West	Far West	Salvage
Adult	0	0	0	0	0
Larvae/Juvenile	0	0	0	0	0

TABLE 9. Summary of recent Delta Smelt detections reported since last assessment and the total detections for the current water year. Notes reflect latest information on reported detections or completion of survey for the water year and include both larval and adult detections.

Sampling Method	New Detections	WY2021	Notes
EDSM	0	11	Phase 2 began 3/29/2021 Last Detection: 5/6/2021
SKT	0	0	SKT : Complete for WY2021
SLS	0	0	Surveys complete for WY2021
20-mm	0	1	Survey 4: Complete Survey 5: Processing Survey 6: Processing Survey 7: 6/15-18/2021
Summer Towner	0	0	Survey 1: Processing Survey 2: 6/21-6/25/21
Bay Study	0	0	June Survey: Ongoing
FMWT	0	0	Ended 12/15/2020
Chippis Island Trawl	0	0	Ongoing 3 days per week sampling
Brood Stock Collections	0	2	Collections complete for WY2021
Total	—	14	Sum of all Delta Smelt observed during the OMR Management Season

- **Historical Trends**
 - Delta Smelt detections in the Sacramento Deep Water ship channel indicate presence upstream of the confluence, but may be freshwater residents and not representative of the migratory life history patterns in Delta Smelt (Hobbs 2019).
 - The three station daily average temperature remains above 20° C and spawning should have ended (Damon 2016).
 - Historically, the highest peak in salvage is in May and the second highest is in June (Grimaldo et al 2009; figure 5).
- **Forecasted Distribution within Central Valley and Delta regions**
 - Predicting the distribution of adult Delta Smelt is currently difficult because detection data is limited to a few individuals and historic patterns may not be representative of the low population levels. None of the detections have been in the central or south delta.
 - Delta Smelt larval distribution is difficult to estimate beyond the Sacramento Deep Water Ship Channel and the Lower Sacramento stratum since these are the only locations in which larval Delta Smelt have been detected. EDSM does not sample the south Delta during phase II.
 - The SMT is using turbidity as a surrogate for adult Delta Smelt presence and in making assessments of the likelihood of entrainment for larval Delta Smelt.

ABIOTIC CONDITIONS

- **Turbidity**
 - Changes in Freeport flows and turbidity (Table 6) that would create “First Flush” conditions did not occur in WY 2021.
 - As of 4/1/2021 the turbidity bridge avoidance trigger of 12 NTU at OBI off ramped.
 - As of 6/14/2021 turbidity continues to be less than 12 FNU at OBI, and is stable at other central and south Delta stations (see Attachment A).
 - South Delta Turbidity conditions are not expected to increase and impact the likelihood of entraining Delta Smelt in the next seven days.

TABLE 10. Relevant Environmental Factors to the current management actions for Delta Smelt.

Date Reported	OBI Daily Average Turbidity (FNU)	Clifton Court Daily Average Temperature	# of Consecutive Days above 77°F
6/14/2021	33.1	22.61°C/72.70°F	0

- **X2 Conditions**
 - X2 is estimated to be at 95.0 km.
 - When X2 is above 81 km, the SMT uses the X2_EC_Graph.xlsx tool to estimate the position of X2 for both the Sacramento and San Joaquin Rivers and assumes the average of the two is representative of an approximate X2 position.
- **Other Environmental Conditions**
 - The Fish and Water Operation Outlook OMR Index values are expected to range between -1,000 to – 1,600 cfs from 6/15/2021 to 6/23/2021.
 - The SMT began monitoring the end of OMR management temperature criteria on 5/18/2021.
 - Real time tracking of environmental conditions, relevant thresholds and Delta Smelt catch data are updated daily at: http://www.cbr.washington.edu/sacramento/workgroups/delta_smelt.html

EVALUATION

1. Between December 1 and January 31, has any first flush condition been exceeded?

The running 3-day average flows and running 3-day average turbidity at Freeport did not exceed the triggers for “First Flush” conditions in WY2021.

2. Do DSM have a high risk of migration and dispersal into areas at high risk of future entrainment? (December 1- January 31)

Delta Smelt were not detected in the South Delta between 12/1/2021 and 1/31/2021. The detection on 11/9/2020 supported Delta Smelt being present in Suisun Marsh and west of the Sacramento-San Joaquin confluence. Additional detections on the 6th, 15th, 21st and 26th of January support a presence of the species in the Sacramento Deep Water Ship Channel, but these fish may represent the freshwater resident population and may not be representative of the migratory life history pattern.

3. Has a spent female been collected?

A spent female Delta Smelt was not observed before 4/1/2021 in WY2021.

4. If OMR of -2000 does not reduce OBI turbidity below 12NTU/FNU, what OMR target is deemed protective between -2000 and -5000?

As of 4/1/2021 the turbidity bridge avoidance trigger of 12 NTU at OBI off ramped. OBI turbidity is currently below 12 FNU.

5. If OBI is 12 NTU/FNU, what do other station locations show?

OBI turbidity is currently below 12 FNU. The daily average turbidities on 6/14/2021 at Prisoners Point (3.16 NTU), Holland Cut (3.44FNU) and Victoria Canal (3.06 NTU) are stable and not expected to increase notably in the next seven days.

6. If OBI is 12 NTU/FNU, is a turbidity bridge avoidance action not warranted? What is the supporting information?

As of 4/1/2021 turbidity the turbidity bridge avoidance trigger of 12 NTU at OBI off ramped.

7. After March 15 and if QWEST is negative, are larval or juvenile DSM within the entrainment zone of the CVP and SWP pumps based on surveys?

As of 6/14/2021, QWEST is expected to be slightly negative to slightly positive over the next seven day period. No larval or juvenile Delta Smelt have been observed in the South Delta as of 6/14/2021.

8. Based on real-time spatial distribution of Delta Smelt and currently available turbidity information, should OMR be managed to no more negative than -3,500?

Delta Smelt are unlikely to be present in the South Delta based on limited detection information this season. Turbidity in the South Delta remains low across most stations (See Attachment A) and there does not appear to be any widespread increases as of 6/15/2021. The OMR index range is between -1,000 to -1,600 cfs for the next seven days and will be protective. This pattern is expected to continue and there is no expected need to manage OMR to no more negative than -3,500 cfs.

9. What do hydrodynamic models, informed by EDSM or other relevant data, suggest the estimated percentage of larval and juvenile DSM that could be entrained may be?

With only nine detections in the Sacramento Deep Water Ship Channel and Lower Sacramento stratum there is not enough data on Delta Smelt to inform hydrodynamic models, and the SMT cannot estimate the percentage of larval and juvenile entrainment.

DELTA SMELT REFERENCES

Damon, L. J., Slater, S. B., Baxter, R. D., & Fujimura, R. W. (2016). Fecundity and reproductive potential of wild female Delta Smelt in the upper San Francisco Estuary, California. *Calif Fish Game*, 102, 188-210.

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- Hobbs, J. A., Lewis, L. S., Willmes, M., Denney, C., & Bush, E. (2019). Complex life histories discovered in a critically endangered fish. *Scientific Reports*, 9(1). <https://doi.org/10.1038/s41598-019-52273-8>
- Polansky, L., Newman, K.B., Nobriga, M.L. et al. Spatiotemporal Models of an Estuarine Fish Species to Identify Patterns and Factors Impacting Their Distribution and Abundance. *Estuaries and Coasts* 41, 572–581 (2018). <https://doi.org/10.1007/s12237-017-0277-3>

Assessment
05/24/2021

Attachment A: Delta Turbidity Report

Turbidity Report was not available before the completion of the Assessment.